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State of Utah
DEPARTMENT OF NATURAL RESOURCES
MICHAEL R. STYLER
Executive Director
Division of Oil, Gas and Mining
JOHN R. BAZA
Division Director

April 22, 2015

Steve Schnoor
Kennecott Utah Copper LLC
4700 Daybreak Parkway
South Jordan, Utah 84095

Subject: Review of April 4, 2015, South Waste Rock Reclamation, Drainage Collection System Kennecott Utah Copper; Bingham Canyon Mine; M/035/0002; Salt Lake County, Utah

Dear Mr. Schnoor:

The Division of Oil, Gas and Mining (Division) received correspondence from Rio Tinto Kennecott on April 4, 2015, regarding the South Waste Rock Reclamation, Drainage Collection System. The amendment includes the following:

- Supplemental document titled – Basis of Design – South End Drainage Collection System – South Waste rock Reclamation Project, stamped by the engineer of record
- Appendix B – South End Drainage Collection System drawings which include:
  1. B.1 - Release for Construction drawings Sheets 10199-C-100 through 10199-C-146
  2. B.2 – As-Built drawing sheets completed as of March 17, 2015 (partial package of the above listed drawings)

Following the completion of construction of the south end basin, a final As-Built package will replace the April 4, 2015, interim As-Built package and include a replacement report for the February 24, 2009, "Hydrologic Assessment of the South End Drainages."

The purpose of the South Waste Reclamation Project is to construct a 6390 basin and to construct lower slopes with an overall slope angle of 2.5H:1V, which will be topsoiled and seeded. The sequence of slope reclamation will be similar to the concurrent reclamation of the Bingham Canyon drainage. Concurrent reclamation will include the placement of suitable soils, including low sulfur-bearing waste rock and salvaged topsoil with a minimum cover depth of 2', and seeding with a mixture of native grasses and forbs.

Attached are review comments which should be included in the final report. Several of these comments relate to map quality and are not specifically required by rule, but responses would clarify the plan. Please contact the project lead, Leslie Heppler, at 801-538-5257 if you have questions about this letter.

Sincerely,

Paul B. Baker
Minerals Program Manager

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UTAH DNR OIL, GAS & MINING

FIRST REVIEW OF MODIFIED NOTICEOF INTENTION TO COMMENCE LARGE MINING OPERATIONS

Kennecott Utah Copper LLC
Bingham Canyon Mine
M/035/0002
April 22, 2015

R647-4-105 - Maps, Drawings & Photographs

General Map Comments

Comment #	Sheet/Page/ Map/Table #	Comments	Initials	Review Action
1	Appendix B All drawings	Standard design graphics use dashed lines for existing contours and solid lines for constructed contours. Contour intervals should be stated near the scale bar. All references to slope grade using a ratio should be identified as *H:1V.	mpb	
2	Appendix B All drawings	Please delete the ratio scale ("Scale 1"=**), as the bar scale is adequate.	lah	

105.3 - Drawings or Cross Sections (slopes, roads, pads, etc.)

Comment #	Sheet/Page/ Map/Table #	Comments	Initials	Review Action
3	Appendix B Omission	The Division requests a plan view schematic diagram of the entire sediment control network to lead into Drawings 10199-C-131 through 136. Include in the final report an updated drawing from the February 24, 2009, Hydrologic Assessment of South End Drainages Flow Diagram SHT. 1 of 5 Dwg. No. 450-F-0104.	mpb lah	
4	Appendix B Omission	The Division requests a plan view drawing of the Reclaimed Surface Storm Water Collection System discussed in Section 3.3.1.	mpb	
5	Appendix B 10199-C-103	Contour line weights are faint and don't photocopy or scan very well. The Division requests a better copy.	mpb	
6	Appendix B 10199-C-104	The index contours should be thicker or darker. It is very hard to follow them around to the left side of the page. The Division requests a copy with modified contour lines.	mpb	
7	Appendix B 10199-C-106	Index contour labels are needed for the east side of the road. Spot elevations on local topographic peaks and tops of embankments would be helpful. The native contours are at 5' intervals, while it appears that the	mpb	

		basin contours are at 1' intervals.		
8	Appendix B 10199-C-108	All of the riprapped spillways on this sheet run diagonally from the top of the embankment down the embankment face and cross over the outlet pipes at the toes of the embankments where, according to the profiles, the cover over the pipes is at its thinnest, while the spillway details on sheet 124 indicate the total thickness of riprap at 3'. Please diagram how this will work. Are the outlet pipes daylighting in the riprapped spillways? This is a good idea if it did; the Division would like to understand the construction better.	mpb	
9	Appendix B 10199-C-111	No index contour labels or spot elevations are included. The "Reclaimed toe of slope" line crosses over the "Angle of repose slope" line at the northwest corner of the page. Why is this?	mpb	
10	Appendix B 10199-C-112	The "Angle of repose slope" and the "Reclaimed toe of slope" lines on the profile are identical, at 2.5H:1V.	mpb	
11	Appendix B 10199-C-113 and 114	Line weights, index labels and spot elevations: Some of the index labels shown appear to be floating between contours, and it is hard to tell what label goes with what line. Index contour line weights need to be more defined. On 113, there is no outlet structure footprint shown although a leader identifying it is there. On the profile drawing, the outlet pipe is incomplete and the outlet structure is not shown.	mpb	
12	Appendix B 10199-C-115	Please include index contour labels or spot elevations.	mpb	
13	Appendix B 10199-C-116, 117 & 118	Identify the contour interval in the plan views and identify the vertical exaggeration in the profiles.	mpb	
14	Appendix B 10199-C-127	There are no index labels for either the native contours or the basin contours. There appears to be a mistake at the east end of the south cut slope contours for Basin 1.2. Please correct.	mpb	
15	Appendix B 10199-C-140 thru 143	On the downstream sides of the cutoff walls, the impact locations for overflow below the overflow weir notches should have some type of energy dissipation features. None are indicated.	mpb	

R647-4-109 - Impact Assessment

109.1 – Projected impacts to surface & groundwater systems
109.4 – Projected impacts on slope stability, erosion control, air quality, public health and safety

109.5 - Actions to mitigate any impacts

Comment #	Sheet/Page/ Map/Table #	Comments	Initials	Review Action
16	Report Pages 1-3 & 1-4	Figures 1-3, 1-4 and 1-5 should have projected dates (approximate year) in the image captions as Figure 1-2 does. What is the projected time frame to achieve final design grade of the waste rock pile as shown?	mpb	
17	Report Fig 1-3	Include a legend for the four different colors in Figure 1-3.	lah	
18	Report Fig 1-3, 1-4, 1-5	Should include stage labels as referred to in the text on page 1-5.	lah	
19	Report Pg 1-3 last para	The text says, "…Figure 1-4...slopes up to 7440." Actually Figure 1-5 shows the slopes up to 7440. Please rewrite to clarify.	lah	
20	Report page 1-5 last para	Provide further definition of native soils and segregated low sulfide rock. Specifically, give the average and minimum thicknesses of each.	lah	
21	Report Fig 1-6	Include an arrow with the 2% back slope discussed on page 1-3 on figure 1-6.	lah	
22	Report Page 1-6:	Where is sediment periodically removed from the basins disposed of?	mpb	
23	Report Page 2-? Omission	Include a bulleted summary of the construction sequence for the typical basin.	lah	
24	Report Omission	Provide construction/deconstruction(?) details in text on the upper cutoff walls.	lah	
25	Report Section 3.2.3, Page 3-4	It is stated that the basins on top of the 6390 bench are supposed to control runoff until the final fully reclaimed slopes have revegetated. These basins, though, are shown as temporary and will be consumed as the upper lifts are placed, so there will be a significant time frame during which those runoff control features will be reduced, then eliminated. The last sentence in this section acknowledges that unvegetated slopes have a higher curve number (CN) that is applicable to Figure 1-2 from about 2007, but it is unclear as to whether the hydrologic modeling considered those conditions before the attainment of the final fully reclaimed slopes, that are being revegetated to (near) undisturbed conditions. (This again is related to project timing.) The modeling for the final design used a CN of 68, while the CNs before vegetation becomes effective are going to be significantly higher, at least 80 or so. It would have been more "conservative" to use the higher CNs for design, and then once fully vegetated, keep the extra capacity as an additional safety factor for the long term.	mpb	
26	Report Section	Thank you for using the increased runoff travel time. Where paragraph 1 ends with "see Figure 3-2," it should also refer to Appendix B, Sheet	mpb	

	3.3.1	10199-C-119.		
27	Report Section 3.6	Based on "required" pipe design specifications in Table 3-7 versus the As-Built flow diagrams, what is the time frame for the scheduled upgrading of the existing lower collection piping?	lah	
28	Report Omission	Include a paragraph on the clean out and maintenance procedures of the collection system	lah	